



UNITED STATES PATENT AND TRADEMARK OFFICE

At

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/659,884	09/11/2003	Thomas P. Gall	IS01231AP	4998
22917	7590	02/17/2005	EXAMINER	
MOTOROLA, INC. 1303 EAST ALGONQUIN ROAD IL01/3RD SCHAUMBURG, IL 60196			BUI, HUNG S	
			ART UNIT	PAPER NUMBER
			2841	

DATE MAILED: 02/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/659,884

Applicant(s)

GALL ET AL.

Examiner

Hung S. Bui

Art Unit

2841

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 14-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>09/11/2003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Claims 14-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected claimed invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 01/04/2005.

2. Applicant's election with traverse of claims 1-8 in the reply filed on 01/04/2005 is acknowledged. Applicant argues that the group I and II are related as combination and subcombination and should be rejoined. This is found persuasive. Claims 9-13 are rejoined with claims 1-8 and will be examined on merit. Applicant has withdrawn claims 14-20. Furthermore, applicant's election with traverse of restriction species in the reply filed on 01/04/2005 is acknowledged. Restriction species has been withdrawn. All figures will be examined on merit.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2841

4. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being obvious over Meny et al. [US 5,170,326] in view of Walles et al. [US 5,925,298].

Regarding claim 1, Meny et al. disclose an electronic module having a flexible circuit board assembly comprising (figure 4):

- a flexible circuit board (54) with at least one layer having a first portion (the region on the left side of the plurality of holes 78) and a second portion (the region on the right side of the plurality of holes 78) separated by a bendable region (a region between the first and second regions); and
- a substantially rigid substrate (11) having a first portion (the region on the left side of the plurality of apertures 64) and a second portion (the region on the right side of the plurality of apertures 64, figure 4) separated by a bend region (a region between the first and second regions), the rigid substrate having an inside surface (52a) and outside surface (52b), the first and second portions of the circuit board being affixed to the respective first and second portions of the substrate (figure 1), the substrate bend region having one of the group of a recess (62) and aperture (64, figure 4) extending outwardly from the outside surface of the substrate.

Meny et al. disclose the instant invention except for the substrate bend region having one of the group of a recess extending outwardly from inside surface to a center of bendable region.

Walles et al. disclose a substantially rigid substrate (10, figure 1) having a bend region (18, figure 6) including at least one of the group recess (26 or 28, figures 2a-b) extending outwardly to a center of bendable region.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to reverse the positioning of grooves of Meny et al., since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art. *In re Einstein*, 8 USPQ 167.

Regarding claim 2, Meny et al. disclose the first and second portions of the circuit board and the substrate being bent at less than a one hundred eighty degree angle to each other as measured from the inside surface (figures 2, 6).

Regarding claims 3-4 and 11, Meny et al., as modified, disclose the instant invention except for the bendable region of the circuit board having a single bend radius of no less than 3-5 millimeters.

Walles et al. disclose the width of the bend region (18) varying depending upon the number of layers of conductive traces and the amount of the circuit board would be bent.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to use a bend region no less than 3-5 millimeters in order to enable the circuit boards to be bent facing each other and prevent breakage.

Regarding claims 5 and 12, Meny et al., as modified, disclose the instant invention except for the specific width of the bend region of the substrate.

The specific width of the bend region of the substrate would have been an dictated by the specific application and type of the circuit board used.

Regarding claims 6-7, Meny et al. disclose the circuit board having a plurality of conductive traces (84), conductive vias (86), and conductive pads for securing and interconnecting electrical components (figure 4) thereto.

Meny et al. disclose the instant invention except for the circuit board being multiple layers of a glass weave impregnated with an epoxy resin.

Walles et al. disclose the circuit board being multiple layers of a glass weave impregnated with an epoxy resin (figure 1, column 2, lines 25-35).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to use the circuit board design of Walles et al. for the circuit board of Meny et al., for the purpose of increasing amount of circuitry in the circuit board and providing better flexibility for the bending region of the circuit board as taught by Walles et al.

Regarding claims 8 and 13, Meny et al., as modified, disclose the bend region being substantially coplanar with a longer of the first and second portions of the substrate.

Regarding claim 9, Meny et al. disclose an electronic module having a flexible circuit board assembly comprising (figure 4):

- a flexible circuit board (54) having a first portion (the region on the left side of the plurality of holes 78) and a second portion (the region on the right side of the plurality of holes 78) separated by a bendable region (the region between

the first and second regions), wherein the circuit board has a plurality of conductive traces (84), conductive vias (86), and conductive pads for securing and interconnecting electrical components (figure 4) thereto;

- a substantially rigid substrate (11) having a first portion (the region on the left side of the plurality of apertures 64) and a second portion (the region on the right side of the plurality of apertures 64, figure 4) separated by a bend region (the region between the first and second regions), the rigid substrate having an inside surface (52a) and outside surface (52b), the first and second portions of the circuit board being affixed to the respective first and second portions of the substrate (figure 1), the bend region having one of the group of a recess (62) and aperture (64, figure 4) extending outwardly from the outside surface of the substrate; and
- the first and second portions of the circuit board and the substrate being bent at less than a one hundred eighty degree angle to each other as measured from the inside surface (figure 2).

Meny et al. disclose the instant invention except for the circuit board being a multiple layers of a glass weave impregnated epoxy resin; the bend region of the substrate having one of the group of a recess extending outwardly from inside surface to a center of bendable region.

Walles et al. disclose the circuit board being a multiple layers of a glass weave impregnated with an epoxy resin (figure 1, column 2, lines 25-35).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to use the circuit board design of Walles et al. for the circuit board of Meny et al., for the purpose of increasing amount of circuitry in the circuit board and providing better flexibility for the bending region of the circuit board.

Walles et al. disclose a substantially rigid substrate (10, figure 1) having a bend region (18, figure 6) including at least one of the group recess (26 or 28, figures 2a-b) extending outwardly to a center of bendable region.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to reverse the positioning of grooves of Meny et al., since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art. *In re Einstein*, 8 USPQ 167.

Regarding claim 10, Meny et al., as modified disclose the instant invention except for the specific angle between the first and second portions of the circuit board and the substrate as measured from the inside surface.

The specific angle between the first and second portions of the circuit board and the substrate as measured from the inside surface would have been dictated by the specific application and type of circuit board used.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung S. Bui whose telephone number is (571) 272-2102. The examiner can normally be reached on Monday-Friday 8:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (571) 272-1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

2/11/05
HB



PHUONG T. VU
PRIMARY EXAMINER